Tiffany, Bruce

From: Cargill, Dan (ECY) [DACA461@ECY.WA.GOV]
Sent: Saturday, January 06, 2007 2:02 PM
To: Winstanley, Iris
Cc: Keeley.Karen@epamail.epa.gov; Flint.Kris@epamail.epa.gov; Jennie Goldberg; Beth Schmoyer; Tiffany, Bruce
Subject: RE: Slip 4 Status Report
Attachments: Slip4_StatusReport_01052007.doc

I'll do some more research tomorrow.

Dan
425-649-7023

From: Winstanley, Iris [mailto:IRIS.WINSTANLEY@saic.com]
Sent: Friday, January 05, 2007 3:12 PM
To: Cargill, Dan (ECY)
Subject: Slip 4 Status Report

Dan,

Attached is the draft Slip 4 Status Report. Information that I don't have is highlighted in yellow. Also, I need to summarize the property reviews and renumber the reference list (as noted in the document), and finish the actual revised ES-2 table, which I will finish this afternoon.

I am heading out (b) (6) and will not have access to email until about 6:00 tonight, but I wanted to get this in your hands today.

It seems as though there should be some kind of a summary or conclusion -- shall I add that?

Please let me know what you think, add info as appropriate, or send me additional information and I will incorporate it.

Thanks,

Iris

Iris Winstanley
SAIC
Office: 425-482-3334
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Slip 4 Source Control Status Report
January 12, 2007

This document summarizes source control activities that have been conducted since preparation of the Slip 4 Source Control Action Plan (July 2006). Table ES-2 of the Action Plan identified source control actions, priorities, and responsibilities. This table has been updated, and source control actions conducted to date are described below.

High Priority Source Control Actions

Facility/Site: NBF
Responsible Party: Boeing
Action: Remove PCB joint sealant.
Status: Complete

The remaining 1,450 linear feet of joint sealant material at NBF with PCB concentrations up to 79,000 mg/kg was removed by Boeing in 2006 (Personal communication, Carl Bach to Dan Cargill , Slip 4 source control meeting July 13, 2006).

Joint sealant material at Boeing Everett with PCB concentrations over 1 mg/kg was removed and replaced with new material. Recent testing found that the new joint sealant material has been contaminated with PCBs. Boeing analyzed samples of the joint sealant material that was used to replace the original PCB caulk and found it has been contaminated with PCBs at concentrations ranging from less than 1 mg/kg to 370 mg/kg. Boeing is continuing its investigation of this [32]. ~~Results are not yet available.~~

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Deleted: currently being used at NBF [32]
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Facility/Site: NBF / KCIA / I-5
Responsible Party: SPU, Boeing
Action: Distribute 2005/2006 in-line sediment trap data for winter wet season.
Status: Complete

Winter season 2005/2006 sediment trap data were distributed [19, 21]. These traps were installed on August 11, 2005 and removed on March 16, 2006.

In the north drain line (T5/T5A), PCBs (Aroclor 1254, 1248, and 1260) were detected at 114 mg/kg; PCBs appears to be increasing steadily from 7 mg/kg in February 2005 and 24 mg/kg in August 2005. The upstream sample along this line contained 0.65 mg/kg PCBs. These results are mirrored in sample T1, collected upstream of the King County lift station. Sample T1 contained 107 mg/kg PCBs (Aroclor 1254, 1248, and 1260); this is a significant increase from the August 2005 result of 10 mg/kg. Sample T1 also exceeded the SQS for mercury and zinc.

Both upstream and downstream north drain line samples contained zinc and BEHP above SQS levels [21] and TPH-oil above the MTCA Method A cleanup level [23]. In addition, the downstream sample exceeded the SQS for mercury and di-n-octyl phthalate, while the upstream sample exceeded the SQS for copper.

In central lateral #2 (T4/T4A), PCB concentrations were 1.1 mg/kg, slightly lower than they were in February 2005. Zinc, BEHP, and di-n-octyl phthalate were present above SQS levels. The upstream sample in this line contained 0.11 mg/kg PCBs.

In central lateral #1 (T3/T3A), PCB concentrations were 1.8 mg/kg, slightly higher than the previous sample in 2005. Zinc, BEHP, and di-n-octyl phthalate were present in this sample above SQS values. The upstream sample in this line contained 0.73 mg/kg PCBs, exceeded the SQS for lead [21], and exceeded the MTCA Method A cleanup level for TPH-oil [23].

In the south drain line (T2/T2A), PCB concentrations were 1.5 mg/kg, slightly higher than the previous sample in 2005. The upstream sample in this line contained 0.38 mg/kg PCBs.

A sediment trap sample collected from the I-5 Storm Drain at Airport Way S. contained 0.25 mg/kg PCBs, down from 7.8 mg/kg in 2005. The sample exceeded the SQS for zinc [21] and the MTCA Method A cleanup level for TPH-oil [23].

Facility/Site:	GTSP
Responsible Party:	SCL
Action:	Remove PCB-contaminated soils; implement erosion or other source control as needed.
Status:	Complete

Integral Consultants, Inc. (for SCL) conducted an interim remedial action in May 2006 to control erosion and offsite migration of contaminated soil near the former low-lying area [4]. The action involved excavation and replacement of contaminated soil behind the retaining wall and other measures to reduce potential ongoing erosion, as listed below:

- Removal of approximately 47 cubic yards of PCB-contaminated soil immediately behind the retaining wall located along the southwest boundary of the GTSP property, for a distance of approximately 125 feet;
- Offsite disposal of excavated soil at an approved TSCA landfill;
- Lining and backfilling of the excavation with clean imported fill material to prevent further loss of soil through the retaining wall joints;
- Installation of silt fencing along the south and southwest property boundary to filter stormwater that may be discharging from the site via overland flow, during larger storm events.

During the remedial action, it was noted that voids located in joints between the concrete panels that make up the retaining wall could not be enclosed by the interim remedial design. August 24, 2006, Integral applied concrete grout to cover and seal the native soil in the voids at the base of the retaining wall joints [5], and thereby to reduce the potential for erosion of PCB-contaminated soil.

During the construction phase of the remedial action (May 2006), subsurface soil samples were collected and analyzed for PCBs. These data will be used to characterize the soil conditions at the base of the excavation for later consideration in developing a site-wide investigation plan. A total of 33 soil samples were collected at approximately 5-foot horizontal intervals at the bottom of the excavation (1 to 3.4 feet bgs). Samples from 19 locations were analyzed for PCBs; concentrations ranged from 0.077 to 3,800 mg/kg (almost exclusively Aroclor 1254) [4].

Comment [DRC1]: Really? I missed this one.

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Facility/Site: NBF
Responsible Party: Boeing
Action: Complete source evaluation at north drain line and complete clean-out.
Status: In Progress

Boeing installed filters on two catch basins along the GSTP fence line area (CB-182 and CB-185). Solids that had accumulated on the filter material were analyzed for PCBs on March 21, 2006. The samples contained 14 mg/kg and 5.5 mg/kg total PCBs, respectively (Aroclor 1254) [7]. Sediment in catch basin CB-173 (the catch basin receiving drainage from CB-182 and CB-185) was re-sampled at the same time; PCBs were detected at 110 mg/kg (Aroclor 1254) [7].

On April 26, Boeing sampled the storm drain lines leading to CB-173 [15]. Samples were collected from the base of CB-182 and CB-185 (the catch basins with filters); PCBs were detected at 6.1 and 11 mg/kg, respectively. A solids sample was also collected from a 6-inch concrete pipe entering CB-179; this pipe enters CB-179 from the north (parallel to the GTSP/NBF fence line) and contained 34 mg/kg PCBs. Another sample was collected at CB-173 in the pipe leading from CB-174 (29 mg/kg PCBs). An accumulation of dark fine sand had collected in this pipe. Groundwater appeared to be infiltrating to this line from an unsealed pipe connection [15]. A sample was also collected from CB-175 (3.2 mg/kg), another influent sources to CB-173.

Boeing subsequently installed a temporary sandbag dam on the 15-inch line at CB-173 that receives drainage from MH-179, MH-179A, and the GTSP fence line catch basins (CB-182 and CB-185). The dam allowed accumulation of enough solid material to collect a sample prior to cleanout of the storm drain lines. This solids sample, collected on May 30, contained 122 mg/kg total PCBs (Aroclor 1254 and 1248) [8].

On May 31, immediately after completion of the interim remedial action at GTSP, Boeing cleaned the storm drain lines and catch basins flowing into CB-173 [8]. In addition, they plugged two 6-inch storm drain lines entering MH-179 and MH-179A from the north that

appeared to be abandoned. By June 22, approximately ½-inch of solids had accumulated in CB-173; another sample was collected, which contained 29 mg/kg PCBs [9]. Boeing postulated that groundwater infiltration from the unsealed pipe connection between CB-174 and CB-173 may be transporting PCBs to CB-173 [9]. To further evaluate this system, Boeing plugged and bypassed this line. They planned to install a sump pump in CB-174, and re-route the drainage directly from CB-174 to CB-173. CB-173 would then be cleaned again and re-sampled.

In July 2006, samples of storm drain solid material were collected from catch basins, manholes, and oil/water separators throughout NBF that historically have detected over 10 mg/kg PCBs [13]. Concentrations generally ranged between 1 and 10 mg/kg in most structures sampled. Higher concentrations of PCBs were detected in the following structures [14]: OWS-186, which is located near the corner of the GTSP (1,200 mg/kg); MH-193, which drains to OWS-186 (191 mg/kg); MH-179 (47 mg/kg); CB-372 (32.8 mg/kg) and CB-370 (28 mg/kg), in the central area of NBF; CB-225 (27.9 mg/kg); and CB-193, CB-194, CB-416, MH-226, MH-249, and OWS-226A (all between 10 and 20 mg/kg). In addition, a sample collected from CB-113 on July 7 contained 31.7 mg/kg PCBs; a re-sample collected on July 25 did not detect PCBs.

During August 2006, Boeing cleaned out the north storm drain line from CB-173 to the King County lift station. This clean-out included at least 20 feet of any side drain lines that connected to manholes along the north storm drain line [16], as well as drain lines associated with OWS-186 [17]. OWS-186 appeared to be quite old; it is a steel underground tank formerly known as UBF-55. The outflow from this unit is blocked, and stormwater apparently fills the separator and then backflows out of the inflow pipe [18]. The line between CB-174 and CB-173 (with the unsealed pipe connected) remained temporarily plugged; Boeing plans to repair this section of the storm drain in the near future.

The remaining 500 feet of north drain line near the King County lift station was cleaned in early October 2006.

OWS-186 was plugged with inflatable pipe plugs on October 11 [22]. In early November, Boeing personnel observed an increase in water level in OWS-186, even though the inflow and outflow lines to this separator had been plugged. The source of water is suspected to be groundwater infiltrating from the unpaved GTSP site. On November 2, a Boeing field engineer pumped water out of OWS-186 to avoid a potential overflow; a slight sheen was observed on the surface of the water in the separator [25]. A grab sample collected from the water at the top of the separator (including the surface sheen) was analyzed for PCBs and contained 47 ug/L (Aroclor 1242). Due to heavy rain, it was necessary to continue pumping water out of this structure. Boeing ultimately removed the downstream plug, thus allowing the OWS to drain [25]. On November 8, Boeing identified another line that leads to OWS-186 [26]; on November 14, the inflow tube was cut off, allowing the installation of a temporary plug from the inside of this unit. the separator was completely pumped out at that time [28].

Boeing is planning to install new drain lines around the separator in 2007 [25]; the unit will then be sealed, filled, and abandoned. On November 17, soil samples were collected to characterize this area prior to construction of the new drain lines [27]. A work plan dated November 14 indicates that six borings were to be installed to a depth of 6 feet below ground surface (bgs) along the alignment of the planned storm drain line; samples were to be collected at three depth intervals (1-2 feet, 3-4 feet, and 5-6 feet bgs). All soil samples were to be analyzed for PCBs. One sample was to be analyzed for TPH and VOCs, and three samples were to be analyzed for toxicity characteristic leaching procedure (TCLP) metals. Preliminary sampling results indicate PCBs in the 200 mg/kg range in the 1-2 foot and 5-6 foot depth intervals [32].

Also on November 17, sediment samples were collected from two catch basins that drain to OWS-186 from the airfield side of the blast fence. CB-1 sediments contained 0.57 mg/kg PCBs; CB-188 sediments contained 0.39 mg/kg PCBs [130].

Another set of catch basin sediment samples were collected on December 8, 2006 [33]. PCB concentrations in these samples ranged from 1.2 to 107 mg/kg. The highest concentrations (107 mg/kg) were found in CB-363 (located at the downstream end of the north drain line, near the northeast corner of Building 3-380). PCBs were also high in MH-187 (64 mg/kg), which is downstream of OWS-186, and CB-194 (28 mg/kg), which drains to MH-187. CB-173 was also re-sampled and contained 43.2 mg/kg PCBs.

Facility/Site: NBF / KCIA / I-5
Responsible Party: Ecology, SAIC
Action: Conduct comprehensive analyses of sediment trap and catch basin data.
Status: Complete

SAIC has completed a draft *Summary of Existing Information and Data Gaps* report for North Boeing Field and the Georgetown Steam Plant, using available information through early September 2006 [37]. This report summarizes historical information about potential contaminant sources at these two facilities and adjacent properties including KCIA. Documented historic releases do not explain the recurring detection of PCBs in the storm drain system at NBF. Potential sources that pose a high potential for sediment recontamination were identified in the report. These include residual PCBs in soil and groundwater in the vicinity of the former low-lying area (GTSP) and UBF-55/UBF-27 area (NBF), and the recurring presence of high levels of PCBs in storm drain structures in various locations at NBF. Potential sources that pose a medium potential for sediment recontamination include: residual PCBs in soil and possibly groundwater in the vicinity of Building 3-333; residual joint material at NBF with PCB concentrations up to 50 mg/kg; and unidentified historic releases of PCBs in the northern portion of NBF~~; and the possible use of PCB-containing joint material at KCIA~~.

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Facility/Site: NBF

Responsible Party: Boeing
Action: Clean OWS-640.
Status: Complete

OWS-640 was cleaned out in August 2006 [16]. The clean-out took about one week to complete. The separator holds approximately 20,000 gallons of water and has multiple sets of coalescing plates that needed to be pressure washed.

Facility/Site: I-5 / Residential Drainage
Responsible Party: SPU
Action: Complete source tracing.
Status: In Progress

A sediment trap sample collected from the I-5 Storm Drain at Airport Way S. contained 0.25 mg/kg PCBs, down from 7.8 mg/kg in 2005. The sample exceeded the SQS for zinc [21] and the MTCA Method A cleanup level for TPH-oil [23]. Round 3 sediment trap data (collected October 16, 2006) was 0.32 mg/kg.

Comment [DRC3]: Sent scanned data
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Facility/Site: KCIA
Responsible Party: KCIA
Action: Sample seven oil/water separators.
Status: Complete

Eight stormwater vaults (oil/water separators) which drain to Slip 4, located in the northern and central portions of KCIA, were sampled on June 6 to 8, 2006. These vaults are configured to allow stormwater to flow through them under low-flow conditions, but allow high-flow bypass to occur via upgradient manhole overflow weirs. Samples were analyzed for PCBs, metals, SVOCs, TPH, TOC, and total solids [11].

PCB concentrations ranged from < 0.04 to 2.1 mg/kg. Only Vault 1680 exceeded 1 mg/kg; this structure drains to Central Lateral #1, where 2005 sediment trap data (sample T2A) indicated 0.18 mg/kg PCBs. Bis(2-ethylhexyl)phthalate (BEHP) concentrations ranged from 29.4 to 232 mg/kg; concentrations were generally higher toward the central portion of KCIA (Vaults 1680 to 1757) and lower at the northern portion of KCIA. Other detected chemicals included high molecular weight polycyclic aromatic hydrocarbons (HPAHs) which ranged from 37.4 to 629 mg/kg; copper at 240 to 1,550 mg/kg; lead from 190 to 744 mg/kg; zinc from 574 to 1,880 mg/kg; diesel-range TPH from non-detect to 16,000 mg/kg; motor oil-range TPH from 3,500 to 81,000 mg/kg; and coprostanol (a sterol used as a biomarker to indicate the presence of fecal contamination) from 25.7 to 34 mg/kg in two vaults at the north end of KCIA [11].

Carbon-normalized results were compared to Sediment Quality Standards (SQS) and Cleanup Screening Levels (CSL) for marine sediment to evaluate potential impacts to Slip 4 sediments. SQS values were exceeded in all eight vaults for at least three chemicals. The

concentration of PCBs in Vault 1680 exceeded the SQS value. In addition, SQS exceedances were present for copper, lead, zinc, phenanthrene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, pyrene, total HPAH, BEHP, and butylbenzylphthalate. PAHs were highest in Vaults 1756 and 1757 in the central area of KCIA (total HPAH of 10.5 and 7.6 mg/kg OC, respectively); the highest BEHP concentrations were also detected in these two vaults (1.1 to 2.8 mg/kg OC) [11].

Facility/Site: KCIA
Responsible Party: KCIA
Action: Complete source tracing.
Status: In Progress

During the March 2006 sediment trap sampling, zinc, copper, and BEHP were detected in trap T5A above SQS levels [21]. Copper and zinc concentrations were significantly higher in the October 2006 samples. Sediment in T3A exceeded the SQS for lead in March 2006. In addition, T5A and T3A exceeded the MTCA Method A cleanup level for TPH-oil [23].

KCIA is currently attempting to track sources of metals and phthalates.

Facility/Site: NBF
Responsible Party: Boeing
Action: Clean out catch basins.
Status: Complete

Boeing cleaned oil/water separator that had PCBs in the sediment and over 1,700 feet of storm drain lines.

Was anything other than the north drain line cleaned out?

Facility/Site: NBF / KCIA / I-5
Responsible Party: SPU, Boeing
Action: Reinstall sediment traps
Status: Complete

The sediment traps were re-installed on March 16, 2006; samples were collected on October 11, 2006 (Boeing) and October 16, 2006 (SPU).

PCB concentrations in the north drain line (T5) continued to increase: 7 mg/kg in February 2005, 24 mg/kg in August 2005, 114 mg/kg in March 2006, and 800 mg/kg (Aroclor 1254) in October 2006 [29]. The upstream sample (T5A) contained 0.6 mg/kg PCBs. In addition, since the previous sampling round, the concentrations of copper, lead, and zinc almost doubled in sediment from T5; copper (640 mg/kg), mercury (2.9 mg/kg), and zinc (1,370

Comment [DRC4]: I'm checking.

mg/kg) exceeded the SQS. Phthalate concentrations increased significantly (BEHP increased from 8.3 to 19 mg/kg), while PAH concentrations decreased slightly. Metals concentrations also increased in the upstream sample; copper (818 mg/kg) and zinc (945 mg/kg) exceeded the SQS. The concentration of BEHP remained at 10 mg/kg [29].

PCBs in sediment trap T1 (upstream of the King County lift station) remained fairly steady from the previous round, at 110 mg/kg total PCBs (Aroclor 1254) [29]. Concentrations of metals in this sample increased by a factor of 2 to 3 since the March 2006 sampling round. Concentrations of mercury and zinc increased to 8.3 and 1,140 mg/kg, respectively in October 2006 [29]. The mercury concentration is a factor of 20 higher than the SQS.

In central lateral #2 (T4), the PCB concentration was 0.9 mg/kg, slightly lower than the previous round in March 2006 [29]. Metals in this sample also increased significantly. Arsenic (70 mg/kg), mercury (0.6 mg/kg), and zinc (2,460 mg/kg) exceeded the SQS. The upstream sample (T4A) contained 0.24 mg/kg PCBs [29]. SVOC data were not yet available.

In central lateral #1 (T3), PCBs were detected at 0.63 mg/kg, slightly lower than the previous round [29]. The concentration of zinc in this sediment trap increased to 660 mg/kg. SVOC data were not yet available.

In the south drain line (T2), PCBs were detected at 1.2 mg/kg, slightly lower than the previous round [29]. Mercury (0.6 mg/kg) and zinc (1,560 mg/kg) were detected above SQS values.

SPU data from traps T2A, T3A, and T6 are not yet available. – Scanned data sent

Facility/Site: KCIA
Responsible Party: KCIA
Action: Test for PCB joint sealant (~ 1 acre); remove as necessary.
Status: Complete

KCIA collected a caulk sample from the Alpha-2 intersection. This is the only exposed caulk at the KCIA site that is within the Slip 4 drainage basin. All caulk in this area was identical in appearance and was therefore assumed to be from the same application with the same materials. PCBs were not detected in this sample with a detection limit of 0.78 mg/kg [20].

Facility/Site: KCIA
Responsible Party: KCIA
Action: Clean out catch basins and lines (if required)
Status: In Progress

KCIA cleaned all catch basins and lines. Cleaning of the eight oil/water separators leading to Slip 4 began in late November and was scheduled to be completed by December 21, 2006. Is there a reference for this information?

Comment [DRC5]: Checking dates

Facility/Site: I-5 / Residential Drainage
Responsible Party: Ecology, SPU, WSDOT
Action: Clean out catch basins and lines (pending results of sediment trap analysis round 3, due 9/2/2006).
Status: On Hold

Third round of sediment trap data not yet available.

Comment [DRC6]: Scanned data sent

Facility/Site: Georgetown Flume
Responsible Party: SPU, Boeing
Action: Investigate connection toward NBF as a possible source of PCBs.
Status: In Progress

September – Boeing found lines plugged. City investigated and smoke tested connections from the other side of the flume in summer. Two new connections were found to MH-100. One 18-inch wood stave, determined to be plugged; one 24-inch concrete line with flow. Appears to connect to a single catch basin. KCIA & Boeing are investigating further.

DAN: I have no information on this. Beth schmoyer to Dan Cargill Personal communication Slip 4 source control meeting, November 30, 2006

Facility/Site: Georgetown Flume
Responsible Party: SCL, SPU
Action: Close connections to flume, remove contaminated sediments.
Status: In Progress

DAN: I have no information on this. Beth schmoyer to Dan Cargill Personal communication Slip 4 source control meeting, November 30, 2006

Medium Priority Source Control Actions

Facility/Site: Crowley Marine / Alaska Logistics
Responsible Party: Ecology, SPU
Action: Conduct physical site inspection confirming outfalls and what they drain(ed).
Status: Complete

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DAN: I have no information on this.

I have to dig up the inspection date by SPU. I think this might be appropraite here as well:
Emerald Services is currently constructing an office building on the property. The old drainage system has been replaced; the new system includes oil/water separator and a single outfall [31]. The drainage swale was excavated and paved over. The other two discharge points that were previously identified have been abandoned.

Facility/Site:	Crowley Marine / Alaska Logistics
Responsible Party:	Ecology, SPU
Action:	Collect stormwater runoff and in-line solids to assess recontamination potential of current operations
Status:	Planned

Facility/Site:	Crowley Marine / Alaska Logistics
Responsible Party:	Crowley
Action:	Clean catch basins and drain lines.
Status:	Planned

Facility/Site:	First South Properties / Emerald Services
Responsible Party:	Ecology, SPU
Action:	Collect stormwater runoff and in-line solids to assess sediment recontamination potential from any ongoing operations.
Status:	Complete

SPU collected sediment samples from catch basins at this site, and did some follow-up testing of materials. DAN – I have no information on this. Beth schmoyer to Dan Cargill Personal communication Slip 4 source control meeting, November 30, 2006

Emerald Services is currently constructing an office building on the property. The old drainage system has been replaced; the new system includes oil/water separator and a single outfall [31]. The drainage swale was excavated and paved over. The other two discharge points that were previously identified have been abandoned.

Facility/Site:	First South Properties / Emerald Services
Responsible Party:	Ecology, SPU
Action:	Investigate two 4- to 6-inch outfalls located on the bank of First South Properties. Determine if the outfalls are still functioning and their drainage areas.

Status: Complete

No inlets were found for these pipes; these discharge points have been abandoned.

Facility/Site: First South Properties / Emerald Services
Responsible Party: Emerald Services
Action: Clean catch basins and drain lines.
Status: Complete

Emerald Services is currently constructing an office building on the property. As part of the construction, the old drainage system has been replaced. The new system includes oil/water separator and a single outfall [31]. The drainage swale was excavated and paved over. The other two discharge points that were previously identified have been abandoned.

Facility/Site: First South Properties / Emerald Services
Responsible Party: Ecology
Action: Reassess drainage swale for erosion and recontamination potential for phthalates.
Status: Complete

On April 5, 2006, three soil samples were collected from the drainage swale by CH2M Hill, for Emerald Services [10]. Total PCBs (Aroclor 1254 and 1260) ranged from 0.013 to 0.12 mg/kg (1.7 to 10.9 mg/kg OC). This is consistent with results obtained during sampling in April 2005, where a sample from this area contained 0.19 mg/kg total PCBs.

The drainage swale area was excavated to a depth of 3 feet in September 2006. Approximately 5,000 pounds of soil was removed. Three samples were collected after the soil removal; PCBs were not detected [24]. The area was paved in October 2006.

Facility/Site: KCIA
Responsible Party: SPU, Ecology
Action: Reinspect KC Surplus Storage, NE T-Hangars, and Schultz Distributing, Inc. as necessary to achieve compliance with BMPs.
Status: Planned

Facility/Site: NBF
Responsible Party: Ecology, EPA
Action: Review results of Ecology's TCP, Waste and Water programs, and King County/Hazardous Waste inspections of NBF (Nov-Dec 2005).
Status: Planned

Facility/Site: NBF
Responsible Party: Ecology, Boeing
Action: Revise Stormwater Management Plan; conduct additional inspections of the NBF facility as necessary.
Status: Planned

Facility/Site: GTSP
Responsible Party: SCL
Action: Conduct additional site characterization to assess need for additional soil removal.
Status: In Progress

During July 27 to August 2, 2006 five soil borings were advanced at locations near the eastern, southern, and western property boundaries [1]. Borehole depths ranged from 13.5 feet to 15 feet below ground surface (bgs). Soil samples were collected at approximately 2-foot intervals from each borehole; samples were analyzed for PCBs, semivolatile organic compounds (SVOCs), cadmium, chromium, hexavalent chromium (Cr^{+6}), mercury, Skydrol components (a hydraulic oil), and total organic carbon (TOC) and total solids (if sufficient sample volumes were available). In addition, headspace screening was performed for each interval; selected samples were analyzed for volatile organic compounds (VOCs) and total petroleum hydrocarbons as gasoline (TPH-G), and diesel- and oil-range hydrocarbons (TPH-Dx). Thirty nine samples were collected; 29 were submitted for analysis and 10 were archived.

Soil sampling results were compared to MTCA Method A or B soil cleanup levels and to EPA soil screening levels for migration to groundwater. Screening levels were exceeded for PCBs (2 locations), carcinogenic polynuclear aromatic hydrocarbons (cPAHs; 2 locations), and tributyl phosphate (1 location). PCBs were detected at concentrations from < 0.03 to 3.8 mg/kg; the screening level of 1.0 mg/kg was exceeded near the southern drainage ditch (0 to 3 feet bgs) and low-lying area (4 to 6 feet bgs).

Other exceedance of screening levels were found as follows:

- Boring GTSP-1 (northeast side of the Power House) – cPAHs
- Boring GTSP-2 (former fire training pit) -- tributyl phosphate
- Boring GTSP-3 (southern drainage ditch) -- cadmium, total chromium, cPAHs
- Boring GTSP-4 (along the western fenceline) – cPAHs
- Boring GTSP-5 (former low-lying area) -- total chromium, TPH-G

Groundwater monitoring wells were installed in each of the five boreholes to evaluate potential groundwater contamination at the GTSP. Groundwater will be monitored quarterly for 12 months. The first round of groundwater samples was collected on August 1-2, 2006. Samples were analyzed for PCBs, SVOCs, TPH-G, TPH-Dx, VOCs, total and dissolved metals (cadmium, chromium, mercury),dissolved Cr^{+6}, Skydrol, and TOC [1].

PCBs (Aroclor 1242) were detected only in well GTSP-5 (former low-lying area), at a concentration of 0.24 ug/L (which exceeds the MTCA Method B groundwater cleanup level of 0.044 ug/L). In addition, trichloroethylene (TCE) exceeded the screening level in well GTSP-1 (near the Power House); 12 analytes, including cPAHs, were not detected however detection limits exceeded the screening levels.

The second round of groundwater sampling was conducted in November. Results have not yet been received.

Facility/Site: Boeing Plant 2
Responsible Party: Ecology
Action: Inspect Building 2-122 area, sample onsite storm drain solids.
Status: Planned

Facility/Site: Boeing Plant 2
Responsible Party: Boeing
Action: Clean onsite storm drain system as necessary.
Status: Planned

Low Priority Source Control Actions

Facility/Site: Crowley Marine / Alaska Logistics
Responsible Party: Ecology, SAIC
Action: Compile and evaluate historic groundwater quality data; complete historic use investigation to identify data gaps for recontamination potential (soil and groundwater).
Status: Complete

SAIC prepared a Technical Memorandum to assess the potential for Slip 4 sediment recontamination via groundwater discharge from the Crowley and First South Properties [38]. The report concluded that the main potential for sediment recontamination is associated with PAHs in the southern portion of the Crowley property (Parcel D). PAHs in this area are widespread, occur at high concentrations relative to screening levels, and are present in both soil and groundwater. In addition, the downgradient extent of groundwater having significant exceedances of screening levels is poorly defined. SAIC recommends that a series of groundwater monitoring wells be installed along the Parcel D shoreline and sampled for chemicals of concern to allow better assessment of the recontamination potential.

Facility/Site: Crowley Marine / Alaska Logistics
Responsible Party: Ecology
Action: Determine means to fill data gaps.

Status: Planned – January 2007

Facility/Site: Crowley Marine / Alaska Logistics
Responsible Party: Ecology
Action: Conduct sampling if necessary and evaluate data.
Status: Planned

To support Slip 4 sediment removal action design, a pre-design investigation was conducted in June 2006 by Integral Consulting, Inc. for the City of Seattle. As part of this investigation, six seep samples were collected from five locations along the eastern bank of Slip 4. Two of these samples were along the banks of the Crowley property (SP-01 and SP-04). PCBs were detected at 0.1 ug/L (Aroclor 1254) and 0.02 ug/L (Aroclor 1248), respectively [2]. (Note: the State marine chronic water quality standard for PCBs is 0.03 ug/L.)

Facility/Site: First South Properties / Emerald Services
Responsible Party: Ecology, SAIC
Action: Compile and evaluate historic groundwater quality data; complete historic use investigation to identify data gaps for recontamination potential (soil and groundwater).
Status: Complete

SAIC prepared a Technical Memorandum to assess the potential for Slip 4 sediment recontamination via groundwater discharge from the Crowley and First South Properties [38]. The report concluded that the potential for sediment recontamination associated with the First South Properties site is low.

Facility/Site: First South Properties / Emerald Services
Responsible Party: Ecology
Action: Determine means to fill data gaps.
Status: Planned

Facility/Site: First South Properties / Emerald Services
Responsible Party: Ecology
Action: Conduct sampling if necessary and evaluate data.
Status: Planned

To support Slip 4 sediment removal action design, a pre-design investigation was conducted in June 2006 by Integral Consulting, Inc. for the City of Seattle. As part of this investigation, six seep samples were collected from five locations along the eastern bank of Slip 4 and were analyzed for PCBs. Three of these samples were along the banks of the Emerald Services site (SP-02, SP-03, and SP-05). PCBs were not detected [2].

A composite bank soil sample was collected from locations near the drainage swale and the southern boundary of the First South Properties site during the pre-design investigation [2]. PCBs were detected at 0.092 mg/kg (5.4 mg/kg OC). In addition, arsenic (14 mg/kg), cadmium (0.5 mg/kg), chromium (22.8 mg/kg), copper (62.3 mg/kg), lead (64 mg/kg), mercury (0.07 mg/kg), zinc (101 mg/kg), cPAHs ( ), diesel-range hydrocarbons (640 mg/kg), and motor oil (75 mg/kg) were detected.

Facility/Site:	KCIA
Responsible Party:	SPU, Ecology
Action:	Conduct follow-up inspections at Shultz Distributing, Inc. until compliance achieved. Evaluate potential contaminants of concern and pathways.
Status:	In Progress

Inspected by Ecology Tanks unit. Corrective measures are being required. No evidence of releases. King County, Ecology, and Seattle will coordinate to ensure site meets compliance

DAN: I have no information about this.

Comment [DRC7]: I will dig up the inspection report

Facility/Site:	Boeing Plant 2
Responsible Party:	Ecology, EPA
Action:	Assess existing groundwater data in the area
Status:	Planned

Facility/Site:	Other Upland Properties
Responsible Party:	Ecology, SAIC
Action:	Review data for contaminants of concern or pathways to Slip 4 for North Coast Chemical Company, Marine Vacuum Service, Inc., American Avionics/KC Airport, Arco Station #5218, KC Airport Maintenance, American Avionics, and Rainier Ice & Cold Storage.
Status:	Complete

SAIC has completed property review reports for all sites [add refs]. DAN: I still need to summarize these here.

Facility/Site:	Review NPDES Permits
Responsible Party:	Ecology, EPA
Action:	Review permits for COCs found in sediments. This will include both municipal and industrial permits. Permittees affected for Slip 4 include Boeing (NBF), Boeing Plant 2, Emerald Services, Alaska Logistics, KCIA, WSDOT, and SPU.
Status:	Planned

Other Activities

The City of Seattle is planning to purchase the portion of Crowley property that is affected by the proposed Slip 4 sediment removal action [2]. HWA Geosciences, Inc. (HWA) performed a Phase I and Phase II Environmental Site Assessment for Seattle City Light at the Slip 4 upland area to characterize upland soil and groundwater conditions within the City purchase area [3][6]. HWA collected subsurface soil samples at the soil-groundwater interface (typically at 12 to 16 feet bgs) from seven borings near the head of Slip 4. A total of 10 soil samples and five groundwater samples were analyzed for chemical constituents. One of 10 soil samples analyzed contained petroleum hydrocarbon concentrations exceeding MTCA cleanup levels. Six soil samples contained total cPAHs exceeding the MTCA Method A cleanup levels. Two soil samples contained PCB concentrations exceeding MTCA cleanup levels. One soil sample contained arsenic at the cleanup level. Two groundwater samples contained lube-oil-range hydrocarbons above applicable cleanup levels.

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DAN: I need to put in correct order, remove [numbers] and find/replace in text.

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